

SECOND TSUNAMI-DETECTION STATION TO BOLSTER INDIAN OCEAN SYSTEM

Cheryl Pellerin
USINFO Staff Writer

WASHINGTON, SEPTEMBER 3 -- This is the third in a series about U.S. contributions to a global early warning system for tsunamis and other hazards.

Washington -- Experts from the U.S. National Oceanic and Atmospheric Administration (NOAA) will put a second tsunami-warning device in the Indian Ocean in September, as part of the U.S. government's commitment to help the region protect its communities from impending tsunamis and other coastal hazards.

After the 9.1-magnitude earthquake off Sumatra, Indonesia, in December 2004 and a tsunami whose waves inundated Indian Ocean coastlines and killed 230,000 people, the U.S. government established a two-year, \$16.6 million program to help nations there begin to build an early warning system.

Experts from U.S. agencies contributed to the effort, including the U.S. Agency for International Development, which manages the program; NOAA; the U.S. Geological Survey (USGS); the U.S. Department of Agriculture Forest Service (USFS); the U.S. Trade and Development Agency (USTDA); and the State Department.

The project officially ends September 30, but U.S. involvement will continue through agreements with individual countries and participation in the World Meteorological Organization (WMO), the United Nations Educational, Scientific and Cultural Organization's Intergovernmental Oceanographic Commission (IOC) and other bodies.

"We've shared our knowledge and the approach we've learned over the past 40 years building a tsunami warning system in the United States," said Curt Barrett, director of the Indian Ocean Project at NOAA, during an August 15 USINFO interview.

OCEAN OBSERVATIONS

As part of the U.S. effort, in December 2006, NOAA experts and Thai government officials put a deep-ocean assessment and reporting of tsunamis (DART) station in the Indian Ocean, halfway between Thailand and Sri Lanka. (See related article (<http://usinfo.state.gov/xarchives/display.html?p=washfile-english&y=2006&m=December&x=20061201110037cmretrop0.6052667>).)

DART systems provide real-time tsunami detection as waves travel across open waters, and each station is linked to a satellite for real-time data transmission on global networks.

In September, under an agreement with the Indonesian government, NOAA will put a DART tsunameter at 0 degrees north, 89 degrees east, near Sumatra, and Indonesia will maintain the device. The U.S. State Department is providing nearly \$1 million for DART training there.

But DARTs are only part of an all-hazards warning system. A complete end-to-end system includes tide gauges, communications systems, inundation (flooding) modeling, warning dissemination systems, and especially outreach and education to local communities -- what experts call "the last kilometer" -- about what to do in an emergency.

On the ocean side of the U.S. effort, NOAA, with WMO, outlined a detailed architecture for regional and national warning systems, and plans regional and national workshops in September and October.

NOAA upgraded six coastal sea-level gauges in Sri Lanka, Indonesia and the Maldives and contributed seven more gauges. The stations, which are integrated into the Global Sea-Level Observing System network, transmit data at one-minute intervals via satellite.

NOAA also upgraded Global Telecommunication System connections for the Maldives and Sri Lanka, helping those nations share critical data with other Indian Ocean countries and NOAA's Pacific Tsunami Warning Center (PTWC) and receive such data from them.

The PTWC, operational hub of the Pacific Tsunami Warning System, is providing interim tsunami notifications for the Indian Ocean until permanent regional capabilities are established.

NOAA and USAID have established an international accredited training program to be run jointly by the Asian Institute of Technology in Bangkok, Thailand, and the University of Washington to provide courses in essential aspects of tsunami science, emergency planning and operational warnings.

SEISMIC CAPACITY

Large earthquakes generate most tsunamis, and the USGS and Indonesia, Germany, Japan and China have installed 50 to 60 seismic stations spread over 4,500 kilometers along Indonesia's extended land masses.

But "sometimes the stations weren't hooked up to the warning software," said seismologist Walter Mooney, lead coordinator for the USGS Indian Ocean tsunami warning system program, during an August 16 USINFO interview. "That's what we've been addressing."

With the California Institute of Technology and the Betty and Gordon Moore Foundation, USGS installed 27 global positioning system stations in high-risk Sumatra, to track ground motion during earthquakes. Combined with tide gauges and seismic sensors, the stations provide critical information for assessing earthquake location and magnitude.

USGS has conducted technical workshops in cooperation with the IOC in Sri Lanka, Thailand, Indonesia, and the Maldives and has held regional workshops. The agency also has built capacity in Thailand and Indonesia to map earthquake hazard areas.

"I've been amazed at the progress that's been made" in the region, Mooney said. "There's a huge difference in the sophistication and knowledge of the responsible people, just over two years."

THE LAST KILOMETER

USTDA worked with the Thailand National Disaster Warning Center to develop procedures and a decision-support system for warning system operations that speeds response time for public notifications.

USFS and NOAA also supported the center to establish a Tsunami Alert Rapid Notification System, which helps get warnings from the national center to local communities. These efforts resulted in a full-scale national simulation in July with 50,000 participants along the entire Andaman coast -- the most comprehensive drill of its kind in the region.

Even if the Indian Ocean never has another tsunami, Barrett said, "we've given them tools and a data system and the knowledge they need to build a system that will help them deal with hurricanes, cyclones, floods and mudslides -- the threats that they face every year."

See also "Tsunami Early Warning System Takes Shape in the Caribbean" (<http://usinfo.state.gov/xarchives/display.html?p=washfile-english&y=2007&m=August&x=200708171155419lcnirellep0.5727503>) and "Tsunami, Earthquake Detection Improved Since 2004 Disaster." (<http://usinfo.state.gov/xarchives/display.html?p=washfile-english&y=2007&m=August&x=20070817112121lcnirellep0.9808618>)

Information about the National Data Buoy Center (<http://www.ndbc.noaa.gov/dart.shtml>) is available on the NOAA Web site.

More information about the U.S. Indian Ocean Tsunami Warning System (<http://www.iotws.org/>) Program is available on the organization's Web site.

=====

(USINFO is a product of the Bureau of International Information Programs, U.S. Department of State. Web site: <http://usinfo.state.gov>)

GR/ 2007

Note: A Bangla translation of this article is also available from the American Center. If you are interested in the translation, please contact the American Center Press Section, Tel: 8837150-4, Fax: 9885688; e-mail: DhakaPA@state.gov; Website: [http:// dhaka.usembassy.gov](http://dhaka.usembassy.gov)